

# Financing of Renewable Energy Projects



**17<sup>th</sup> NREL Industry Growth Forum**

**October 18-20, 2004**

**By: Ed Feo**

**Milbank, Tweed, Hadley & McCloy LLP**

# Overview



- Project Finance Market Overview.
- Project Finance Characteristics.
- Project Risks.
- Project Documents.
- Current Financing Issues and Trends.

# Project Finance Market Overview

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- Project finance market consists of debt and equity providers.
- Annually \$100 billion invested or loaned.
- Traditional means of financing capital intensive projects – e.g. energy, water, telecom, transportation.
- In renewable energy, has been a significant source of funding for wind, geothermal and biomass facilities.

# Characteristics of Project Finance



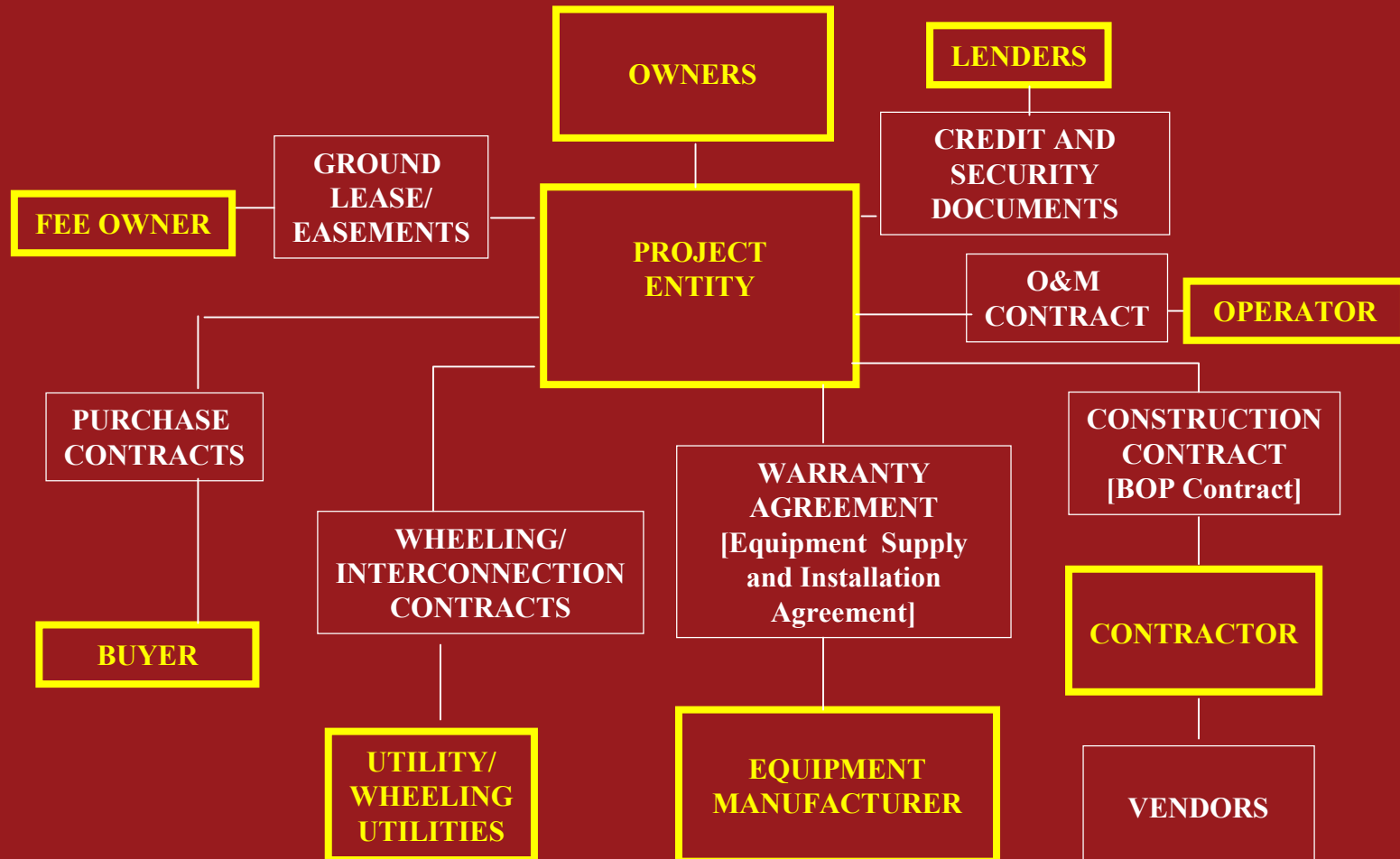
- Special purpose project entity.
- Highly leveraged, long-term capital structure.
- Debt is non-recourse (or limited recourse) to sponsors.

# Characteristics of Project Finance



- Risk allocation and credit support principally from contracts.
- Lender has security in project assets and contacts.

# Project Finance Contracts



# Project Risks

- Technology – proven technology/equipment.
- Completion – will the project be built on time and on budget?
- Revenue – will the project generate enough determinable revenues to service debt? Are revenues paid by a creditworthy offtaker?
- Resource – is resource sufficient? Reliability of resource studies.
- Operation – does the operator have sufficient competencies and incentives?

# Project Risks

- Management – who is in charge of the project's business?
- Site – are all necessary long-term property rights acquired?
- Force Majeure – sufficient contingencies and insurance to handle force majeure events?
- Regulatory Regime – is it stable and determinable?
- Legal System – enforcement of claims, security rights.



# General Issues in Financing Renewable Projects

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- The major issues affecting financing of renewable projects are:
  - Lack of sufficient capital to finance the projected growth in capacity.
  - Availability of long-term reliable resource data and studies.
  - Extent of warranties to support technology.
  - Creditworthiness of sponsor, EPC contractor, turbine manufacturer and offtaker.

# General Issues in Financing Renewable Projects

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- Scheduling of intermittent resources; imbalance penalties.
- Interconnection/curtailment.
- Environmental issues.

# Project Contracts



- Project Contracts:
  - Define relationships among parties.
  - Allocate and mitigate project risks.
  - Provide a framework for obtaining financing.

# Project Contracts



- Issues Related To:
  - Power Purchase Agreements.
  - EPC Contracts.
  - Warranties.
  - O&M Agreements.

# Basic Principles for Power Purchase Agreement

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- PPA is the primary, if not the only source of revenues, for the project.
- Some power purchasers have standard contracts, or at least forms of preferred contracts. Some of these contracts are not well tailored for renewables.
- A creditworthy power purchaser is important for structuring financing of the projects.

# Power Purchase Agreements

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- Quantity:
  - The PPA must be clear as to what is being sold – energy, green credits or tax attributes?
  - Historically these PPAs have not had availability standards. However, the trend to include minimum delivery amounts – with penalties and adjustments.
  - May also have maximum delivery amounts – penalties and adjustments. Limit kWh peak or aggregate kWh?

# Power Purchase Agreements

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- Energy payment terms for PPAs may include:
  - Tariff (single fixed tariff vs. on-peak and off-peak tariffs).
  - Inclusion of environmental credits.
  - Adjustment for PTCs if the latter are not available.
  - Adjustment for capacity factor or output (see penalties).
  - Adjustment for change in law/capital expenses:
    - Which laws?
    - Funding by buyer?

# Power Purchase Agreements

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- Force Majeure:
  - Will include the usual matters outside of party's control, but will also include specific events (weather, ice, wind, etc.) affecting construction or operation of project.
  - Treatment of transmission constraint and ISO curtailment orders as force majeure events.



# Power Purchase Agreements

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- Damages for failure to perform can include:
  - Delay liquidated damages – include PTCs.
  - Penalties for failure to deliver/accept delivery, with damages measured by:
    - Cost of cover plus lost PTCs;
    - Calculation methodology for lost production.

# Power Purchase Agreements

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- Transmission and Scheduling:
  - Historic approach left buyer with transmission risks.
  - Buyers fully aware of the scheduling and constraint issues.
  - Trend is to push transmission related risks and costs on to seller (either directly or through force majeure clause).

# Basic Principles for Engineering, Procurement and Construction Contracts

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- Must have creditworthy contractor or guarantor.
- Most aspects of the EPC are allocations of risk.

# Engineering, Procurement and Construction Contracts

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- The fixed-price date-certain model is prevalent among EPC contracts. However, a number of wind projects bifurcate turbine sale, delivery, installation and testing from balance of plant work.

# Engineering, Procurement and Construction Contracts

- Contract Price
  - Usual features include fixed price with change orders for force majeure and owner default or changes in scope of work.
  - Should also have sufficient LDs to compensate borrower for missing PPA milestones and PTC deadlines and to cover debt service.

# Engineering, Procurement and Construction Contracts

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- Completion and payment schedule for wind projects may reflect more of a back-loaded approach.
  - Mobilization payment at execution or delivery of NTP (typically 10-30% of the contract price).
  - Large payment at substantial completion (typically 50-70% of the contract price).
  - Final completion payment (usually 5-15% of the contract price).
  - Often 10% retainage is withheld from milestone payments until final acceptance of the project.

# Engineering, Procurement and Construction Contracts

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- Delay liquidated damages.
  - Usually a flat rate for each day of delay.
  - Inclusion of PTCs lost due to contractor's fault.
- Contractor's liability for delay L/Ds and indemnities is typically capped (with standard carve-outs).
  - Cap at 50 – 100% of overall contract price.
  - Delay damages may be capped at a lower level.

# Engineering, Procurement and Construction Contracts

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- Bifurcated construction and turbine supply.
  - Balance of plant and turbine supply/installation under separate contracts.
  - Non “turn key.” No “EPC Wrap.”
  - More focus on allocation of responsibility between turbine supplier and BOP contractor.
  - Enhanced role of independent engineer.



# Warranties

- Warranties under wind turbine supply agreements are oriented to repair of defects and revenue augmentation:
  - Performance (95% of nominal output) over warranty period. Some manufacturers do not offer performance-based warranties.
  - Power curve (nameplate at designated windspeed; number of turbines tested).
  - Availability (95% in the warranty period; usually with a “Ramp-Up” period).
  - “As delivered” (conformity to specs.).

# Warranties

- Warranties:
  - Conformity to the certificate of design approval (GL, DNV).
  - Freedom from defect in design, manufacture, construction “serial defect” warranty (typically, 10-20% of turbines).
  - Noise, environmental.
  - Evergreen replacement/repaired parts.

# Warranties

- Warranty Period:
  - Typically 5 years.
  - Extensions in some cases:
    - Automatic;
    - If expectation of defects as certified by Independent Engineer or if availability of test not satisfied.
  - Warranty Terms depends on the manufacturer's track record and the strength of developer.
  - Some manufacturers charge warranty fees separate from service fees.

# Warranties

- Remedies (repair, replacement, retrofits).
- Warranty exclusions:
  - Force majeure;
  - Owner actions;
  - Ordinary wear and tear.
- Notification of design defects/serial failures (sometimes required for newer turbine models).

# Warranties

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- Turbine service agreements are customarily provided by the vendor:
  - Term is for duration warranty;
  - Scope of work covers all warranty work; need to correlate to other O&M work;
  - Compensation usually fee-based.

# Warranties

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- BOP warranties (term, scope):
  - Conformity to specs.
  - Free from defect.
  - Term – 1 to 5 years.
- Especially relevant in the bifurcated contract context.

# Warranties

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- A number of vendors have provided access to their technology rights in the event of default:
  - Assignment or escrow of turbine specifications.
  - License for use of technology.
  - License to manufacture parts.

# Operation, Management and Maintenance Contracts (“O&M Contracts”)

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- Operator – experience, resources?
- Fundamental terms of an O&M Contract need to conform with the EPC contract, turbine warranty and the turbine service agreement.
- Term and termination.
  - Often same as turbine warranty agreement.



# O&M Contracts

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- Scope of work.
- Authority of operator.
- Compensation:
  - Prevalent model is cost-plus; fixed fee;
  - Output-based bonuses/penalties;
  - Separate fees (repair services, inventory);
  - Reimbursable cost procedure.

# O&M Contracts

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- Performance standards (usually NERC).
- Operator's liability cap (usually limited to fees).
- Budgets.
- Compliance with other project contracts, applicable laws.
- Insurance.
- Force majeure.
- Remedies for non-performance.
- Dispute resolution.

# Debt Financing Structures

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- Bridge Financing:
  - Construction bridge loan;
  - Vendor loans.
- Permanent Financing:
  - Construction loans convert to term loans;
  - Equity bridge.
- Portfolio Financing:
  - Diversification.

# Typical Financing Terms

- Term:
  - Institutional Tranche up to 20 years;
  - Bank Tranche 10-15 years.
- Interest Rates:
  - Construction: LIBOR + 150 – 200 bps;
  - Equity Bridge (backed by guaranty from sponsor with investment grade credit): LIBOR + 75-100 bps;
  - Bank Term: LIBOR + 150-250 bps (increases over time);
  - Institutional Term: US Treasuries + [285-315] bps.

# Typical Financing Terms

- Minimum DSCR for Debt Sizing.
  - 1.40:1 for first year increasing by 0.01 with average DSCR through loan maturity to 1.50-1.70:1.
- Distribution tests (minimum annual DSCR of 1.20:1; fully funded reserves; minimum working capital).

# Typical Financing Terms

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- Credit Support:
  - Guaranty of performance by investment-grade guarantor under the O&M Agreement and EPC Contract (including Warranties);
  - Guaranty of Construction Loan Repayment, Equity Contributions, Cost Overruns and Mandatory Prepayments;
  - Guaranty of offtaker obligations under Power Purchase Agreement.

# Typical Financing Terms

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- O&M Reserve Account (6 months O&M payments).
- Debt Service Reserve Account (6 months reserve).
- Major Maintenance Reserve Account.
- Distribution Reserve:
  - Cash sweeps for failure to meet DSCR tests.

# Typical Financing Terms

- Market Flex Pricing for Syndication (lenders shifting more underwriting risk to borrowers/sponsors).
- Prepayments:
  - Voluntary -
    - Make-whole payments to institutional lenders.
  - Mandatory -
    - Re-size construction loans at conversion based on DSCR tests;
    - Off-taker creditworthiness trigger.



# Typical Financing Terms

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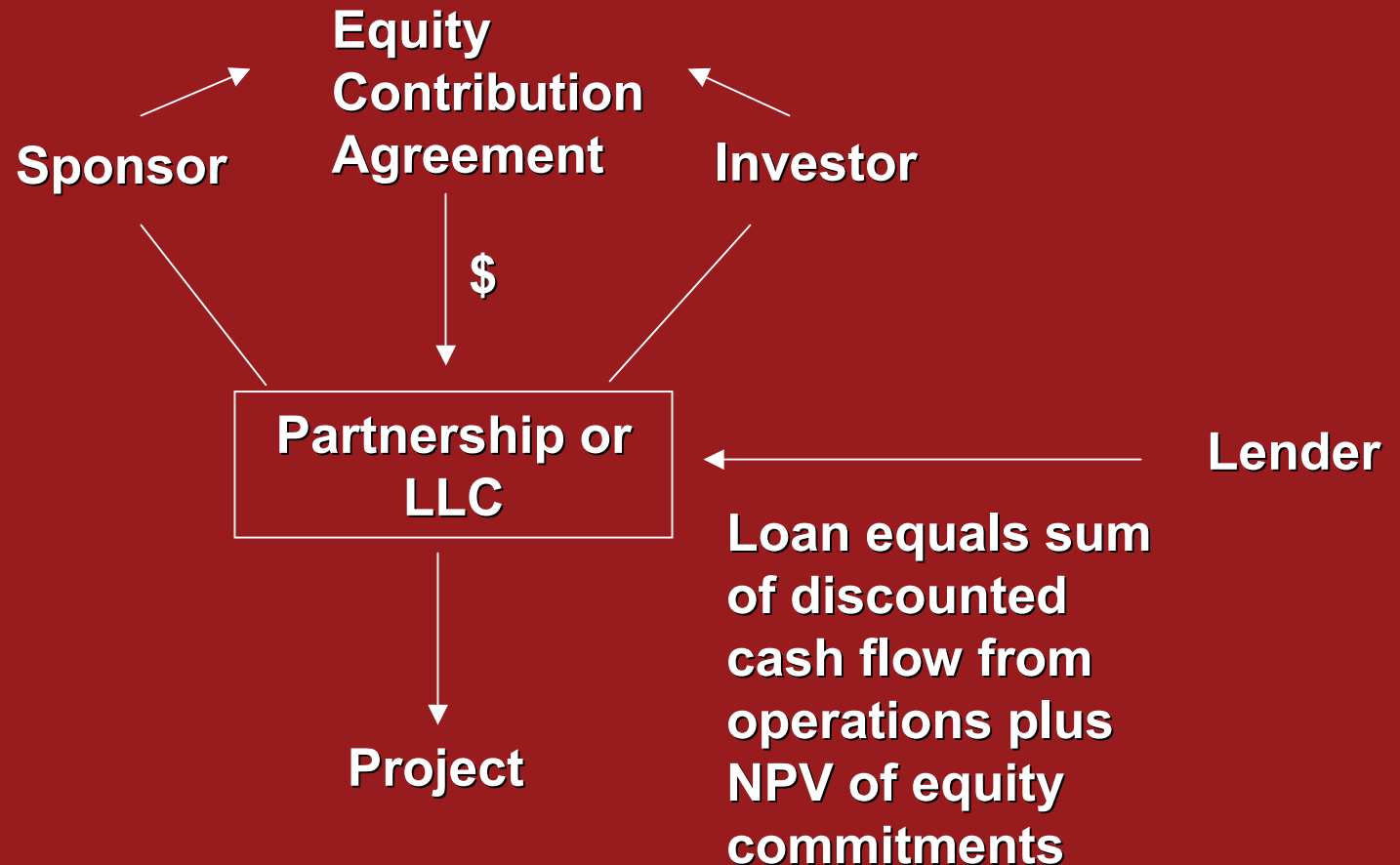
- Agreement by sponsors to contribute to the project up to amount of the PTCs receivable (PTC monetization).
  - Full monetization or monetization up to the waterfall requirement.
  - Tax utilization risk usually allocated to sponsors.
  - Known as “pay as you go” – very much like a PPA.

# Typical Financing Terms

- Correlation of project and financing documents:
  - Construction loan payments tied to construction contract milestones.
  - Term of PPA and credit agreement.
  - Defaults under project documents are defaults under credit agreements.
  - LDs in EPC contract are sized to allow borrower service debt and pay late completion LDs to offtaker under PPA.
  - Covenants in the credit agreement obligate borrower to seek lenders' consent on important construction and operational decisions.

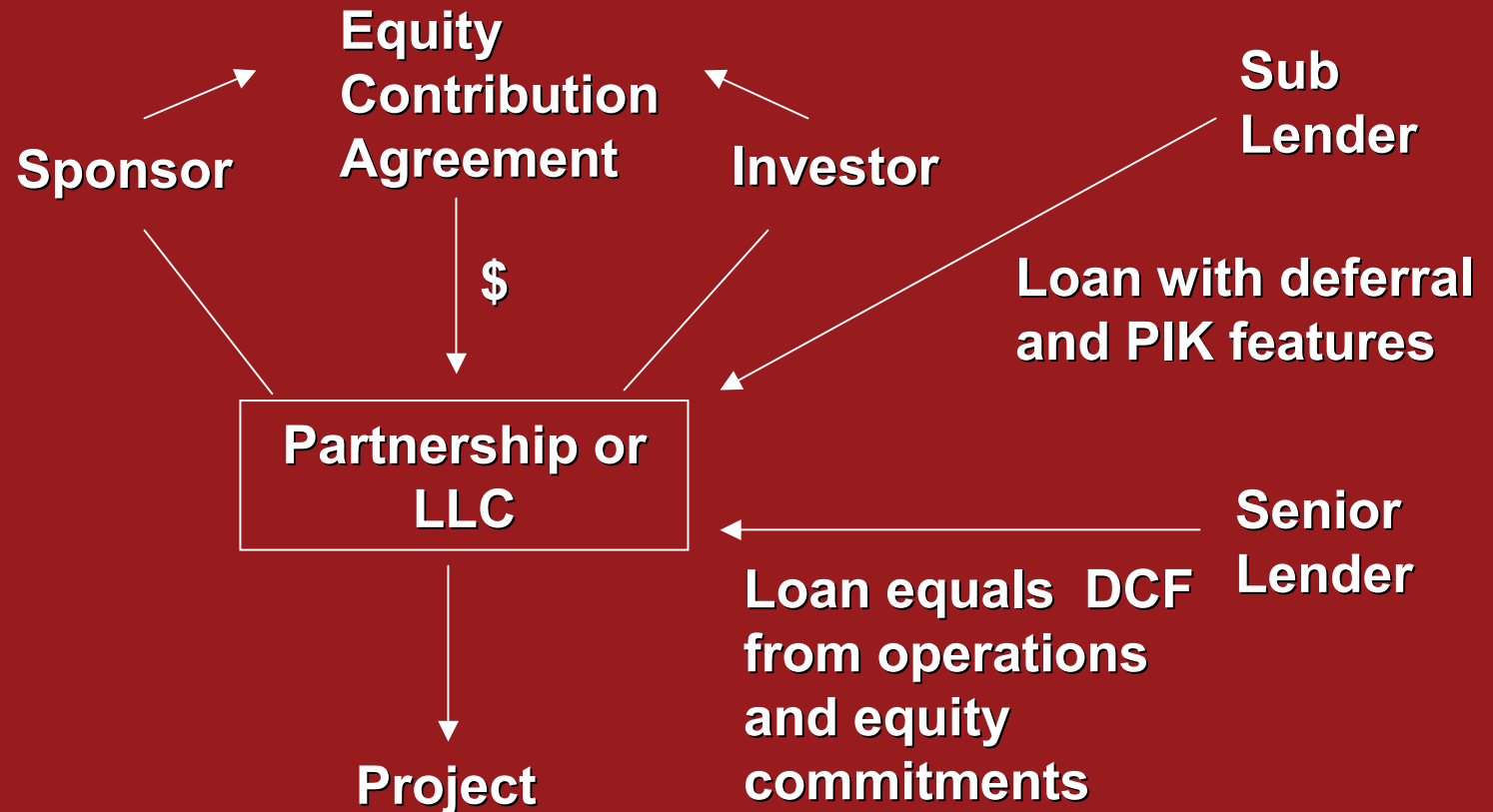
# Typical Financing Terms

## Senior Loan Leveraged Transaction



# Typical Financing Terms

## Senior/Subordinated Loan Transaction



# Recent Financing Terms

- **Brazos Wind:**
  - Shell and Mitsui 50/50 venture.
  - 160 MW wind farm located in Northwest Texas.
  - 160 Mitsubishi MWT-1000A turbines (1 MW). Guaranteed output at 96% for 5 years.
  - 17 year PPA with TXU Portfolio Management (with \$50mm parent guaranty).
  - Construction – joint/several obligation of Texas Wind Power and Mitsubishi.
  - 10 year O&M with Shell subsidiary, and turbine services by Mitsubishi.
  - PPA with minimum production level with penalty of market price x 125% for short deliveries.

# Recent Financing Terms

- Brazos Financing Terms:
  - \$87.5 mm term loan facility (debt/equity = 49/51).
  - 9.5 year terms; 5.5 year average life.
  - Margin – LIBOR + 175-200 bps.
  - Average DSCR of 1.53 and minimum of 1.50.
  - Loan amount/amortization determined to meet 1 year P 99 production.
  - Debt service reserve, major maintenance reserve, REC reserve.
  - Cash sweep if offtake downgrade, curtailment or DSCR < 1.2.

# Debt Financing

- Three Wind Holdings LLC:
  - JV of Shell and Goldman Sachs.
  - Portfolio of three projects: Rock River (50 MW, Wyoming); Cabazon (41 MW, Calif.); and Whitewater Hill (60 MW, Calif.).
  - Power contracts, with CDWR on California projects (10 years) and PacifiCorp on Wyoming project (20 years).
  - Turbines provided by GE, Vestas, Mitsubishi (different for each project). Warranties: 5 years from GE, Vestas; 10 years from Mitsubishi (extendible to 15 years).
  - Portfolio effect of diversity of location/wind regime, turbine supplier, power purchasers.
  - Sponsor “pay as go” equity commitments for PTC.

# Debt Financing

- Three Wind Financing:
  - Term loan of \$117 mm (debt/equity of 56/44).
  - Tenure of 15 years, 5 year average life. 85% amortize within 8 years.
  - Base case average DSCR 1.5x, minimum of 1.4x 1 year P 99 – average DSCR 1.13x, minimum 1.03x.
  - Margin 1.5 – 200 base points; 100% fixed via swap.
  - Debt Service Reserve, O&M Reserve, Non-Routine Maintenance Reserve.
  - Distributions restricted if DSCR < 1.2x.



# Equity Investment Structures

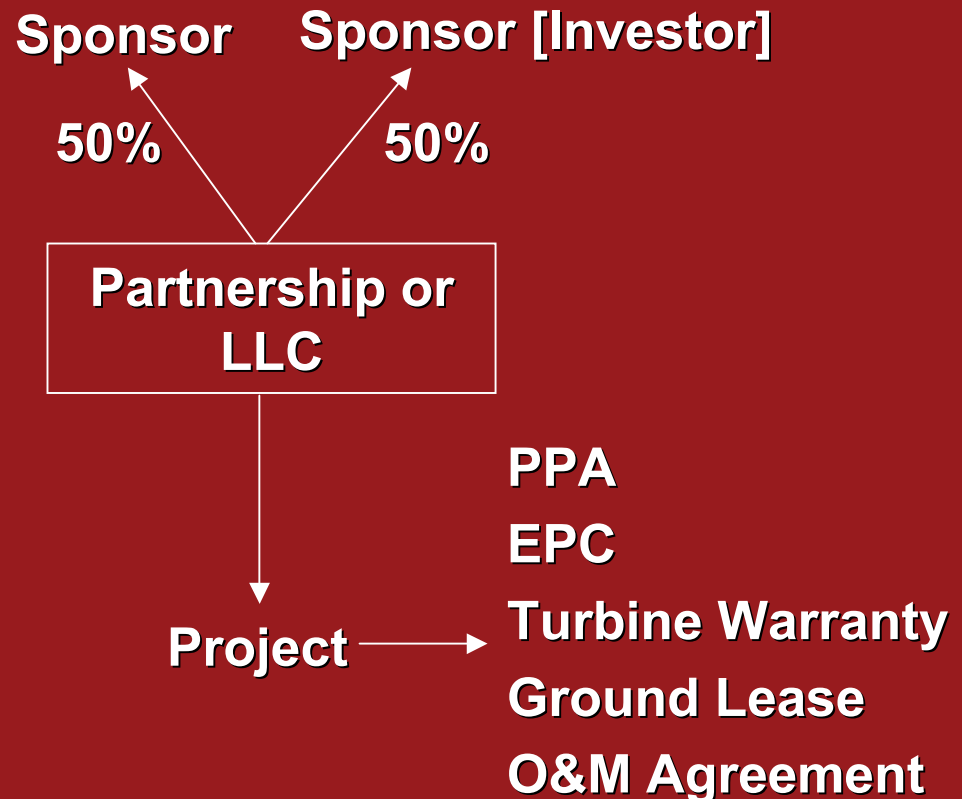
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- Equal Participant Structure:
  - Tax allocation and cash distributions are pro rata.
  - Contributions are pro rata.
  - Voting and management typically by committee with pro rata voting.
  - Relatively simple structures because the interests of the participants are similar.
  - Example: Shell joint ventures.

# Equity Investment Structures

## Equal Participant Transaction

- By purchase or contribution, each party has equal investment
- Management by committee with equal representation
- Additional capital contributions are provided by each party



# Equity Investment Structures

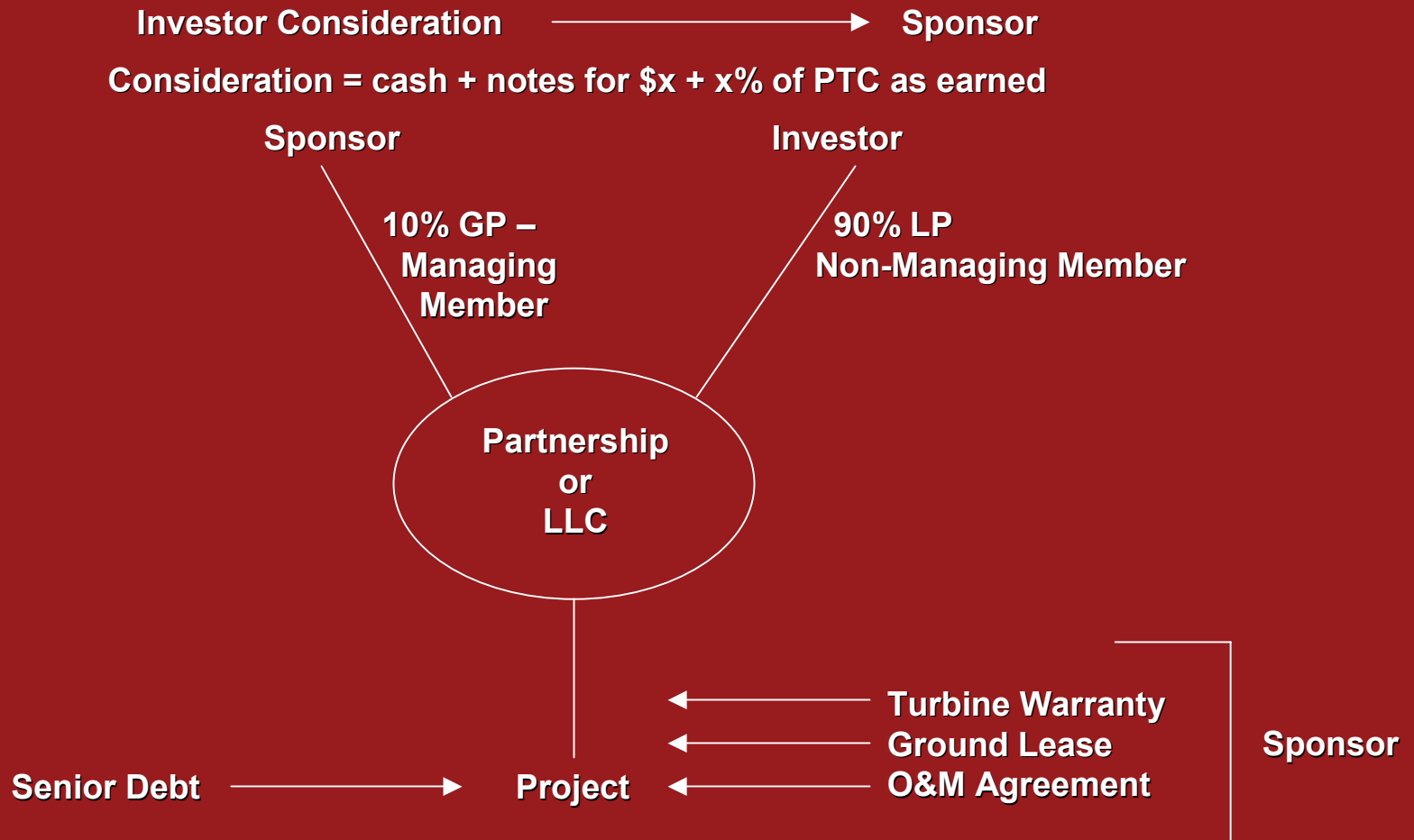
- Cash/Tax Structure:
  - Tax appetite of investors differs.
  - Cash and tax allocations in project company vary.
  - Cash may be further diluted through contracts with cash investor.
  - Management may be equal or use an active/passive model.
  - Several different structures used – e.g., installment sale, flip, etc.

# Equity Investment Structures

- Tax Monetization Structures:
  - Equity investment based on cash flow and tax benefits.
  - Can have “flip” after target return is achieved, plus piece of residual.
- Cash Equity:
  - Supplements “tax equity.”
  - Disproportionate reserve cash allocations, and the inverse of the tax equity interests in tax benefits.
- Subordinated Debt:
  - Market developing to provide sub debt.
  - Higher coupon than senior but lower return than equity.
  - Can have deferral and PIK features.

# Equity Investment Structures

## Cash/Tax Structure – Installment Sale



# Equity Investment Structures

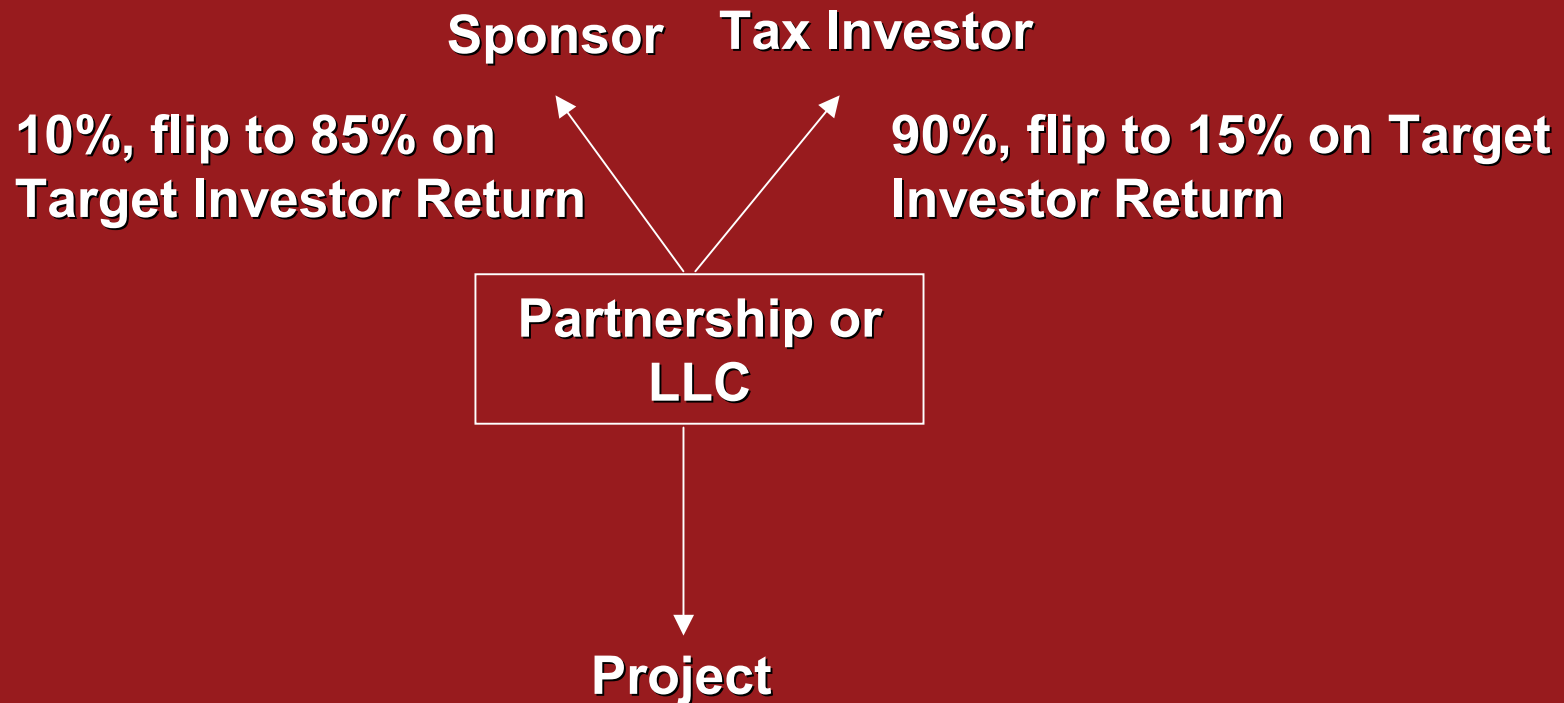


## Installment Sale.

- Investor's purchase price includes:
  - Down payment;
  - Purchase money note/periodic payments;
  - Assumption of capital contribution obligation;
  - Contribution/payment for PTCs earned (pay as you go) based on % ownership;
  - Debt may or may not exist at the Partnership.

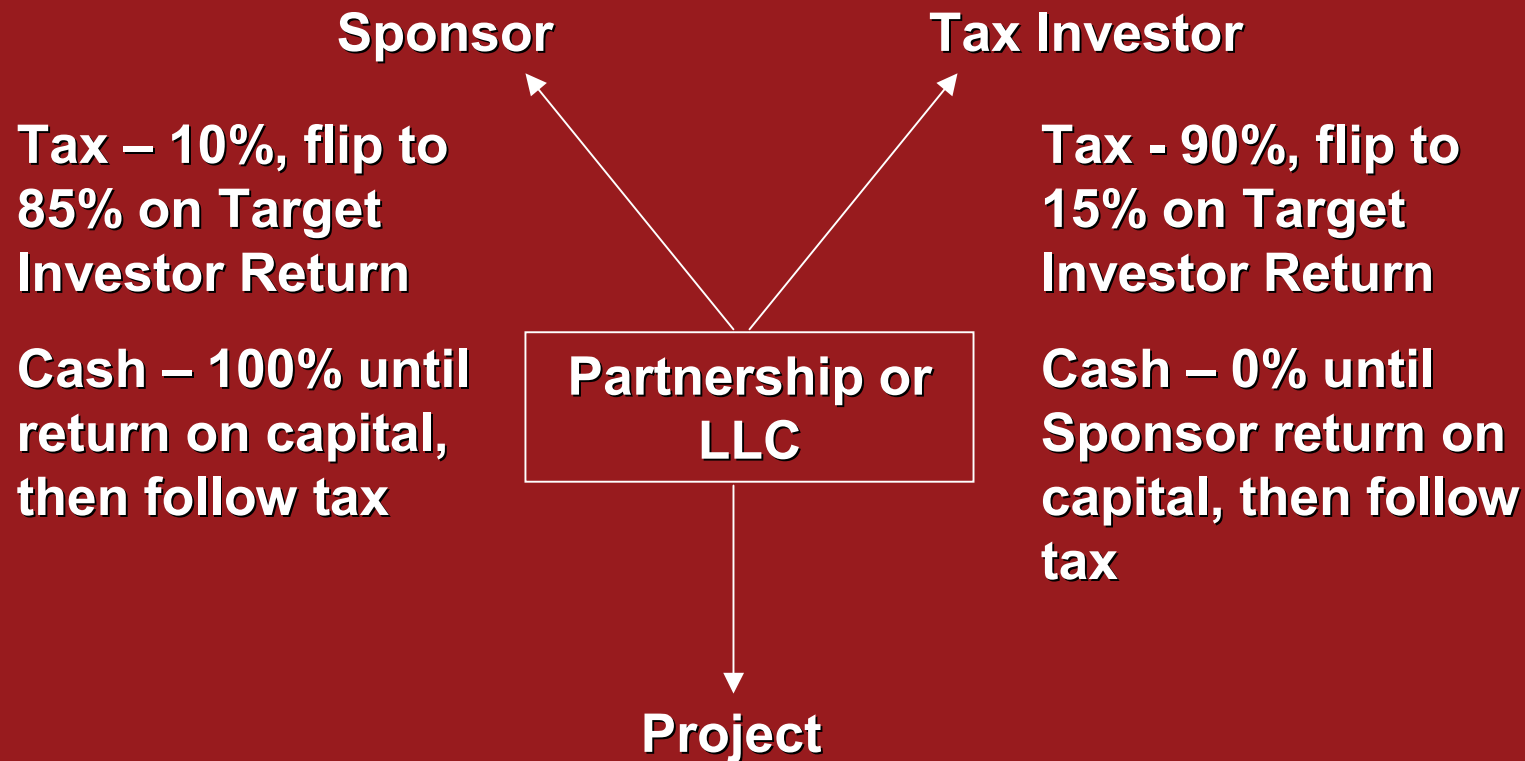
# Equity Investment Structures

## Cash/Tax Structure – Equity Flip



# Equity Investment Structures

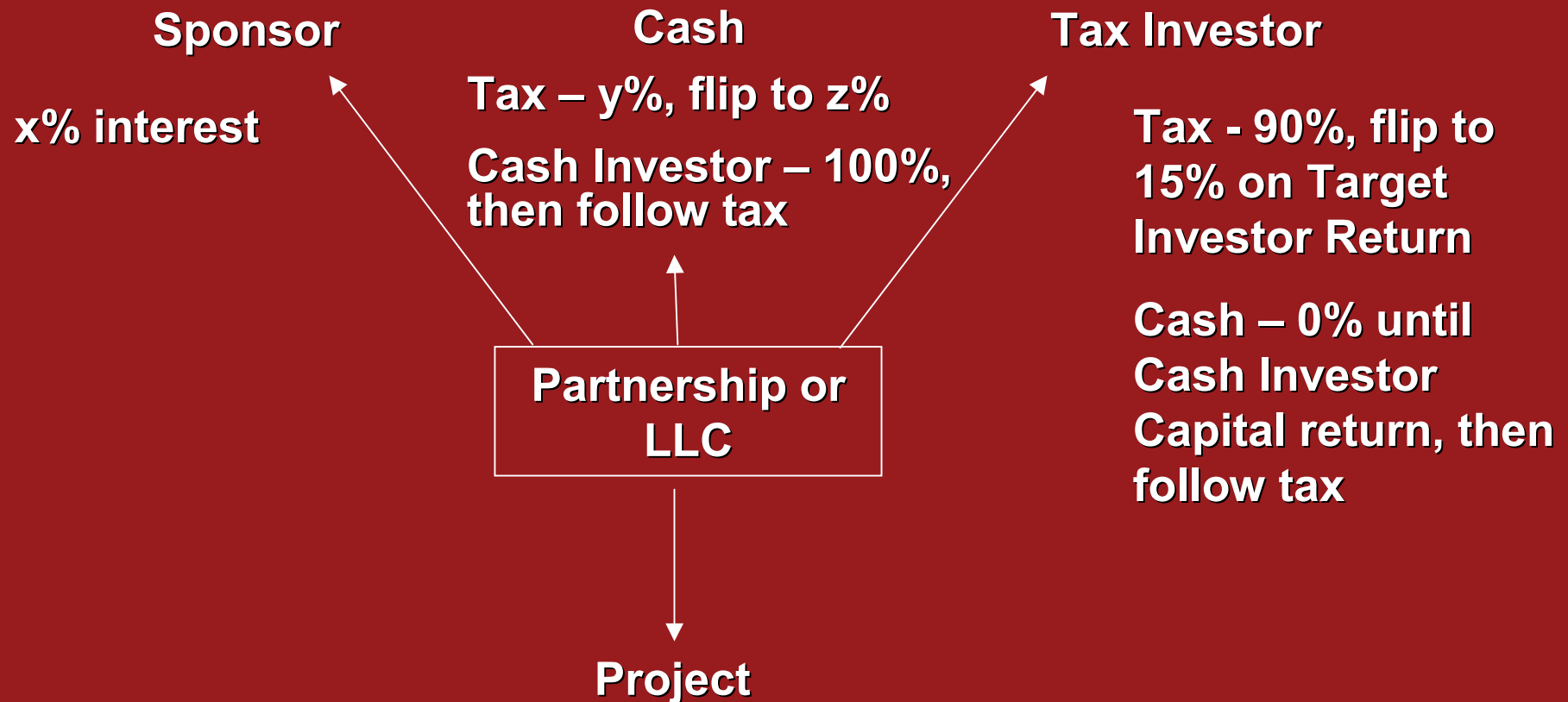
## Modified Flip v. 2.0





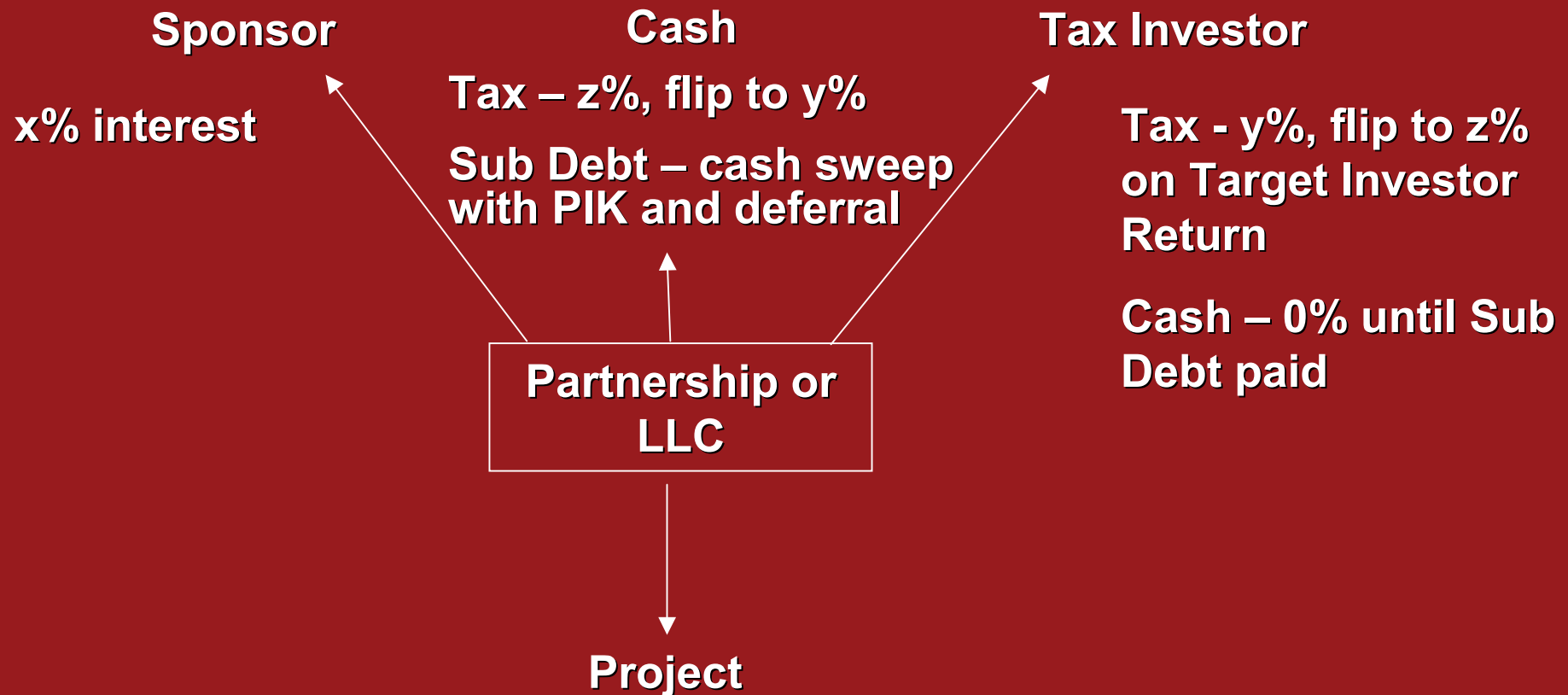
# Equity Investment Structures

## Modified Flip v. 3.0



# Equity Investment Structures

## Modified Flip v. 4.0



# Questions?

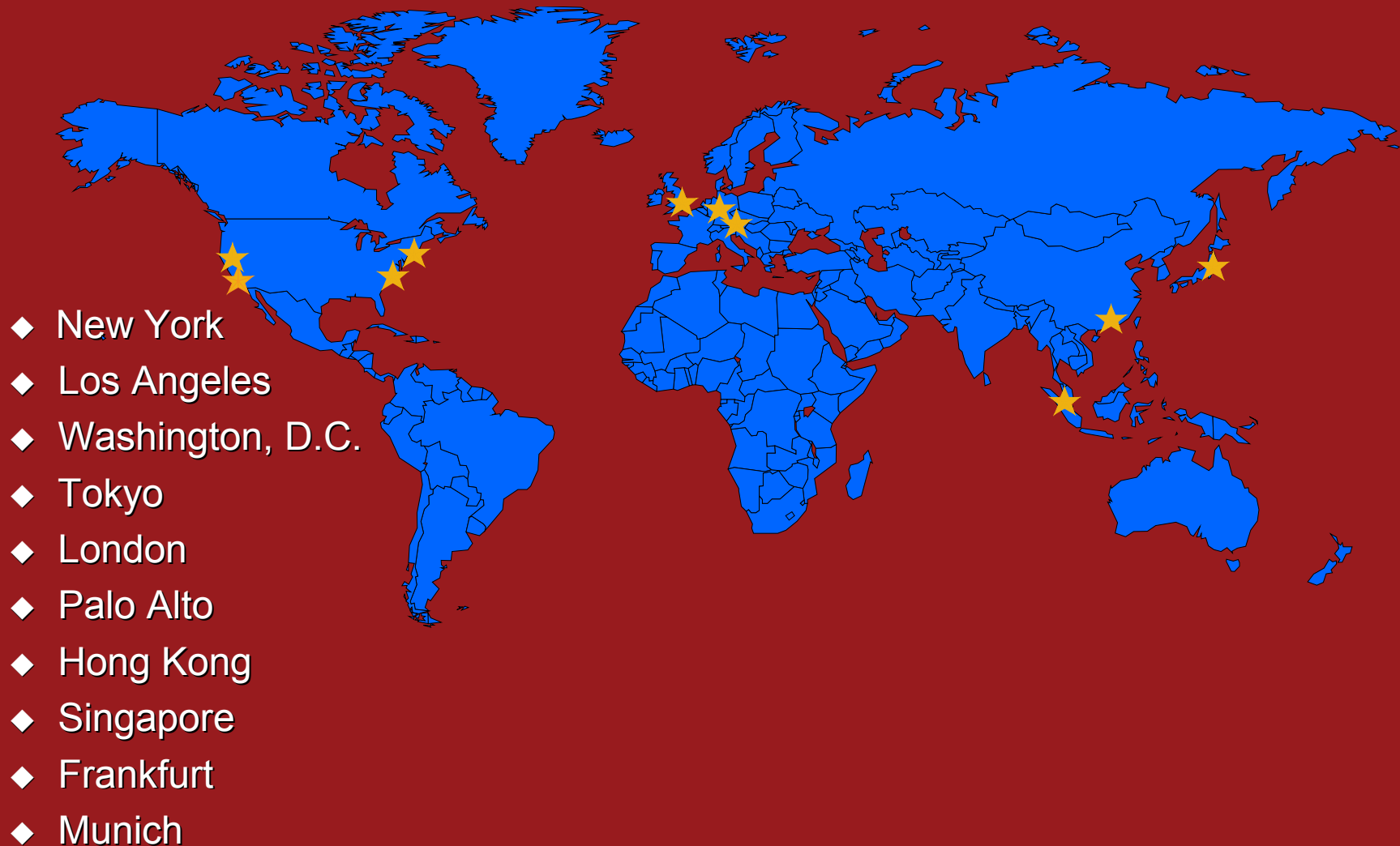


# Milbank's Renewable Energy Experience

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Milbank is a leading law firm in the representation of the renewable energy community. As the global leader in project financing, we bring a wealth of experience to the renewable energy power sector to deliver world-class, cost-effective legal services to our renewable energy clients. We have represented new developers as well as some of the largest sponsors in the industry and have been involved in some of the largest construction and project financings of renewable energy projects to date. As evidence of our experience in this area, Milbank was ranked “Number One” in Dealogic’s Top Ten Legal Advisors for Renewable Project Finance Deals in 2003-2004.

# Milbank's Offices



# Milbank Around the World

## For further information contact:

### New York

1 Chase Manhattan Plaza  
New York, NY 10005  
Tel 212-530-5000  
Fax 212-530-5219  
Attn: Eric Silverman

### Palo Alto

Five Palo Alto Square  
3000 El Camino Real  
Palo Alto, CA 94306  
Tel 650-739-7000  
Fax 650-739-7100  
Attn: Doug Tanner

### Tokyo

Fukoku Seimei Building  
2-2-2 Uchisaiwaicho  
Chiyoda-ku, Tokyo 100-011, Japan  
Tel 011-813-3504-1050  
Fax 011-813-3595-2790  
Attn: David J. Impastato

### Munich

Maximilianstrasse 15  
(Maximilianhoeft)  
80539 Munich, Germany  
Tel 011-089-25559-3600  
Fax 011-089-25559-3700

### Los Angeles

601 South Figueroa Street  
Los Angeles, CA 90017  
Tel 213-892-4000  
Fax 213-629-5063  
Attn: Ed Feo

### London

Dashwood House  
69 Old Broad Street  
London EC2M 1QS England  
Tel 011-44-207-448-3000  
Fax 011-44-207-448-3029  
Attn: Phillip Fletcher

### Hong Kong

3007 Alexandra House  
16 Chater Road  
Central, Hong Kong  
Tel 011-852-2971-4888  
Fax 011-852-2840-0792  
Attn: Young Joon Kim

### Washington

International Square Building  
1825 Eye Street, N.W.  
Washington, D.C. 20006  
Tel 202-835-7500  
Fax 202-835-7586  
Attn: Jonathan A. Maizel

### Frankfurt

Frankfurter Welle  
An der Welle 4  
60422 Frankfurt am Main, Germany  
Tel 011-49-69-7593-7170  
Fax 011-49-69-7593-8303  
Attn: Helfried Schwarz

### Singapore

#14-00 Caltex House  
30 Raffles Place  
Singapore 048622  
Tel 011-65-6428-2400  
Fax 011-65-6428-2500  
Attn: Gary Wigmore